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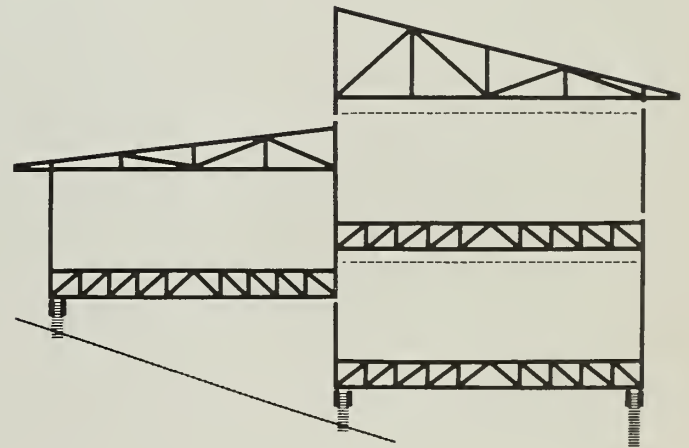
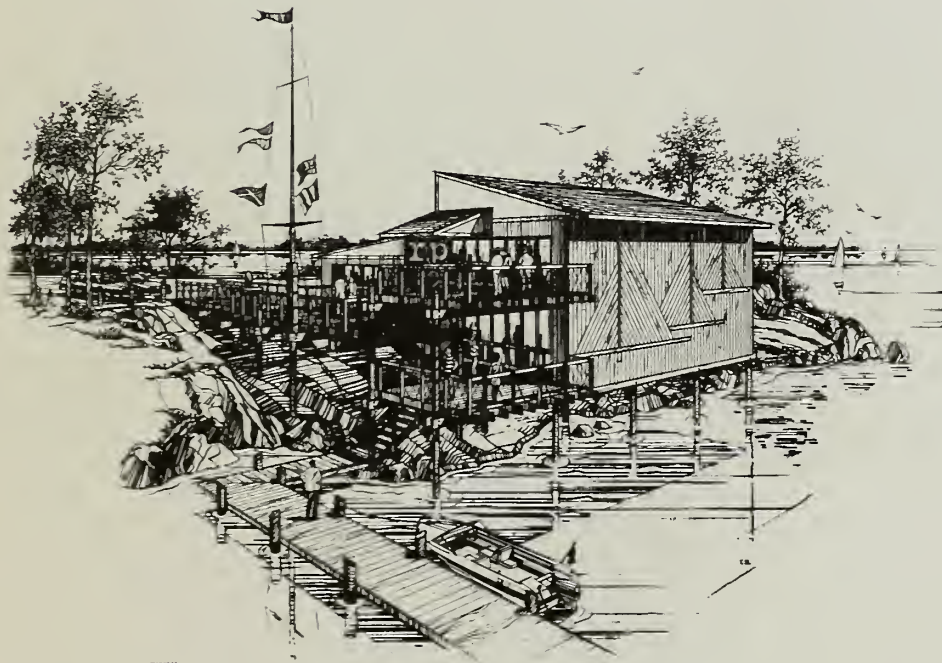
Forest Service

Forest
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Truss-Framed System:

- New Building Technology
- Flexible Design
- Energy Efficient
- Greater Strength
- High Quality
- Fast & Economical



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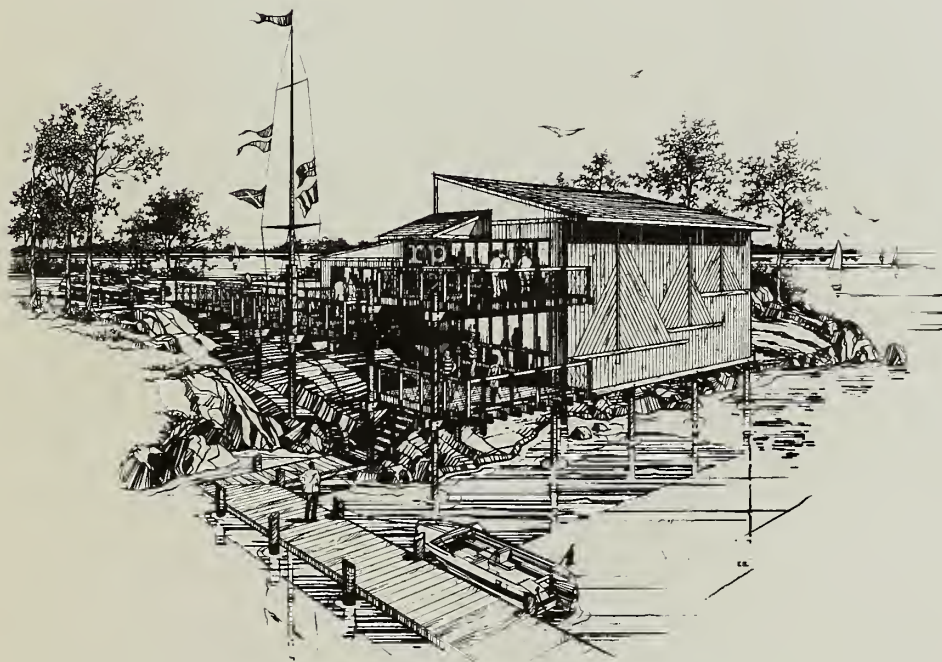
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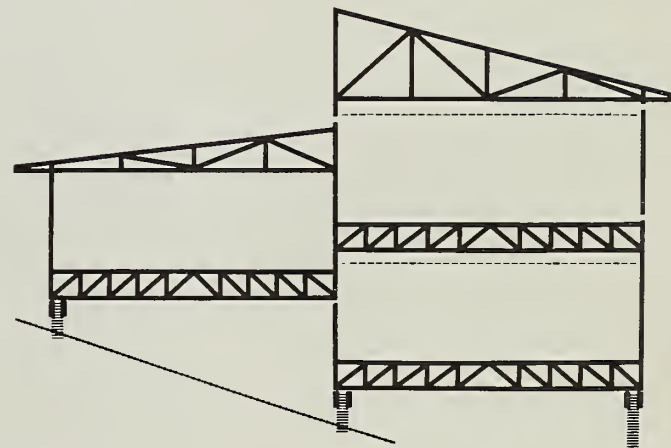


Truss-Framed System:

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Truss-Framed System:

- New Building Technology
- Flexible Design
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If you are a truss fabricator or a builder, the truss-framed system (TFS) might be the solution to your need for faster, more economical and better quality building construction. Truss-framed construction gives the manufacturer and the builder the opportunity to save time, money, and resources with an improvement in construction quality, durability and strength. This booklet contains nine conceptual sketches which illustrate the wide range of design flexibility that can be achieved by TFS.

TFS is readily adaptable and compatible with most any architectural style. This means that, in addition to the simplest rectangular in plan design, L-, U-, T-, split level, and multi-story structures are realizable. Acceptance of the use of TFS in light-frame structures has been acknowledged by the Department of Housing and Urban Development and the International Congress of Building Officials.

TFS offers new technology for residential and light commercial building construction. The system's key structural component is a unitized floor-roof truss which is joined together by regular wall stud. Once connected together with sheathing

these specially engineered components create a wood-frame building which has strength and durability.

TFS requires considerably less structural lumber than conventional construction, and all framing is done with one lumber size, 2 x 4, rather than with more costly dimension lumber commonly used for floor joists and beams. Truss frames are fabricated in a plant under controlled conditions and quickly erected on site by the fabricator or builder.

For most applications, TFS will be faster and less costly than an equivalent size stick built structure. Structural framing and enclosure for an average size house can be done in one day or less. A conventional house would take 1-1/2 weeks using a 3 man crew. This short time by TFS minimizes lost time due to bad weather and it gives the builder a safe place to store equipment and materials.

The TFS is engineered to afford maximum flexibility in architectural planning and design. The system is a marriage of factory and site built construction. Service lines such as electrical and plumbing can be easily installed without cutting or notching structural

members. Heating ducts can be reduced or totally eliminated.

The idea for TFS was conceived at the U.S. Forest Products Laboratory in the late 1970's as part of its mission to extend the Nation's timber resource. The truss-frame system has been assigned public patent and as such is available to anyone who wishes to make use of it. Imagination and creativity are the only limiting factors which prevent application of TFS.

Note: Detailed construction plans of the conceptual sketches shown in this booklet are not available from the Forest Service. Persons interested in obtaining detailed plans should contact area architects or planning services to determine the availability of such plans.

Definitions



Conventional Truss Frame



Partial Truss Frame



Two-Floor Truss Frame

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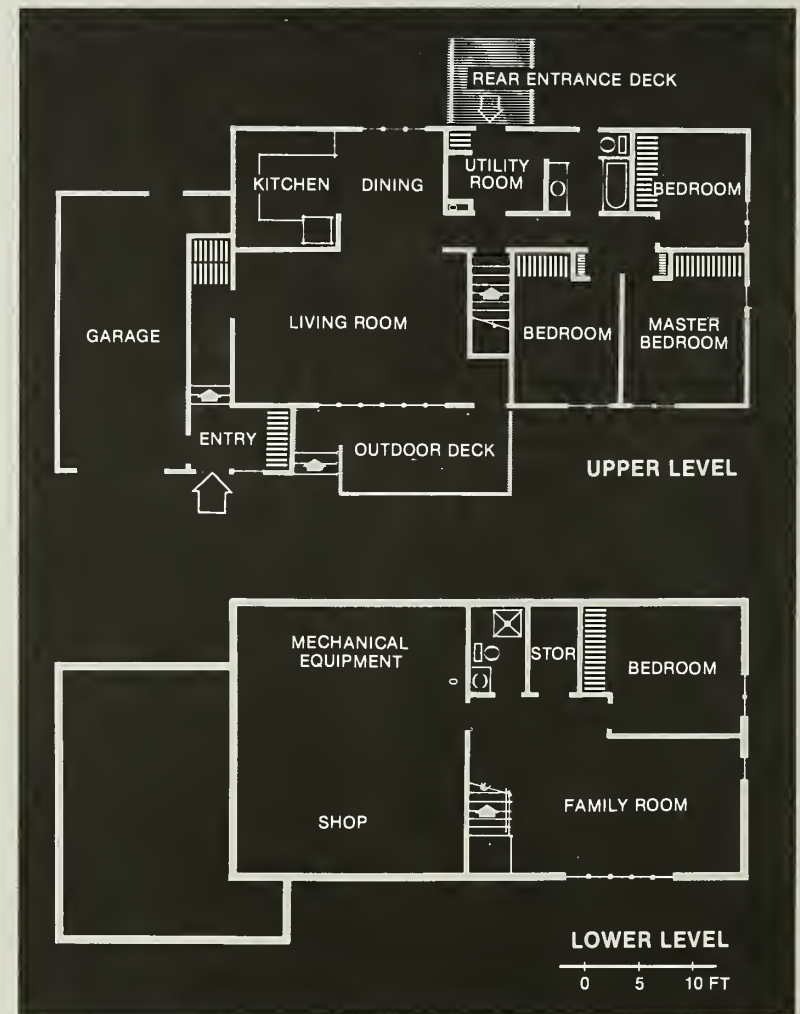
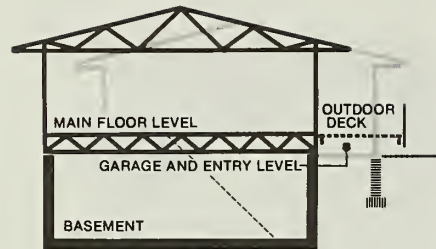
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Truss-Framed System:

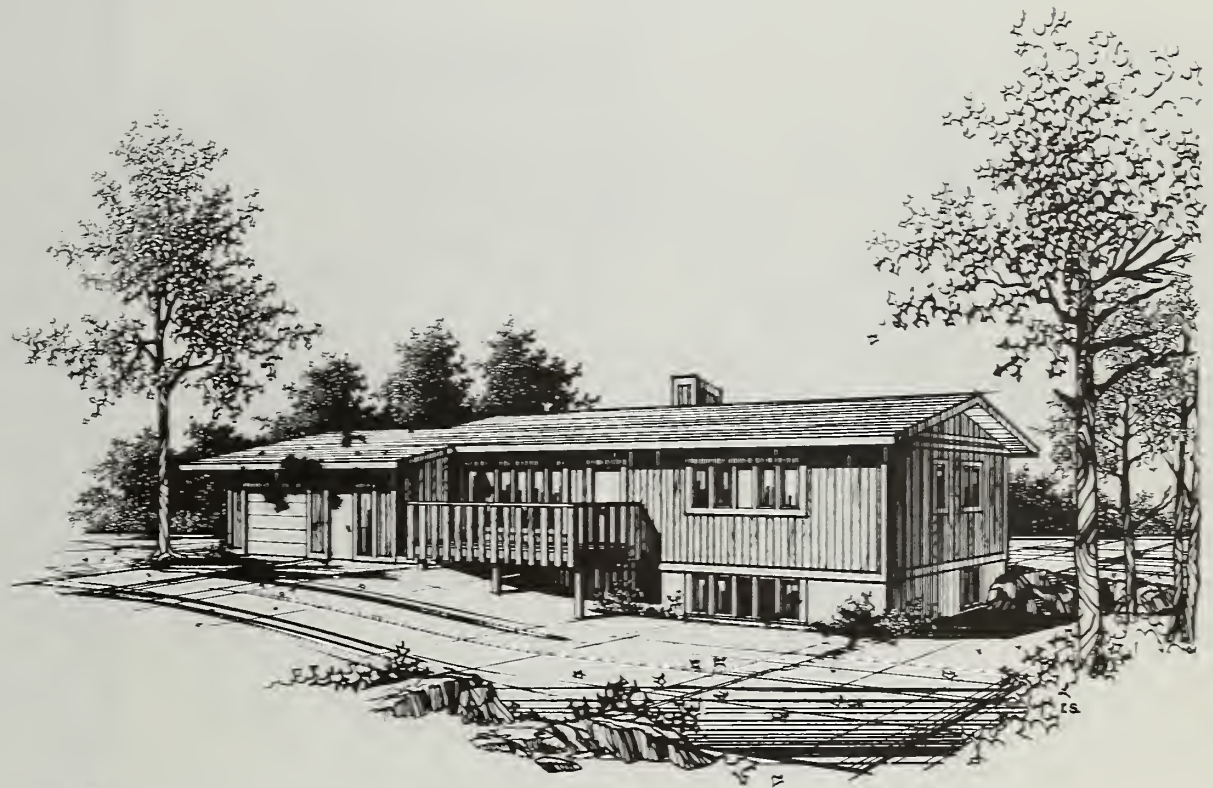
Prairie -- Ranch

Compact 3-bedroom ranch with contemporary styling and cedar siding. Easily adapted to sites with minimal slope that allow finishing and additional bedroom on the lower level. Entrances are protected with multi-purpose air lock vestibules. Center bay containing basement stairs and exterior doors is framed with separate roof and floor trusses. The single-car garage is conventionally framed.



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Truss-Framed System:

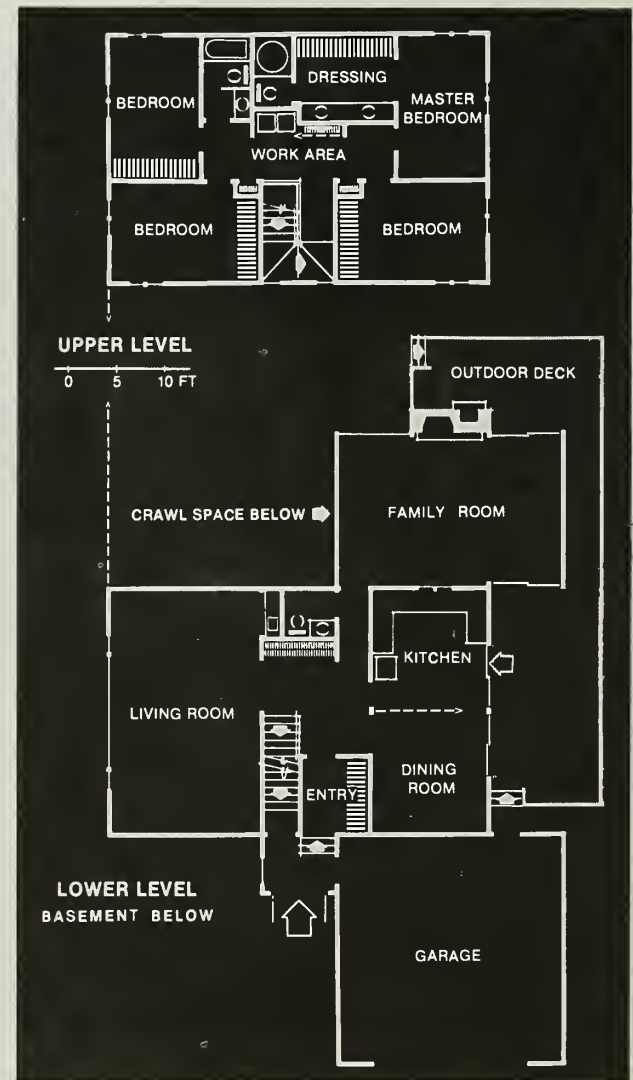
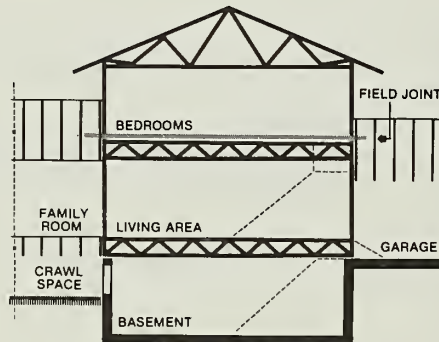


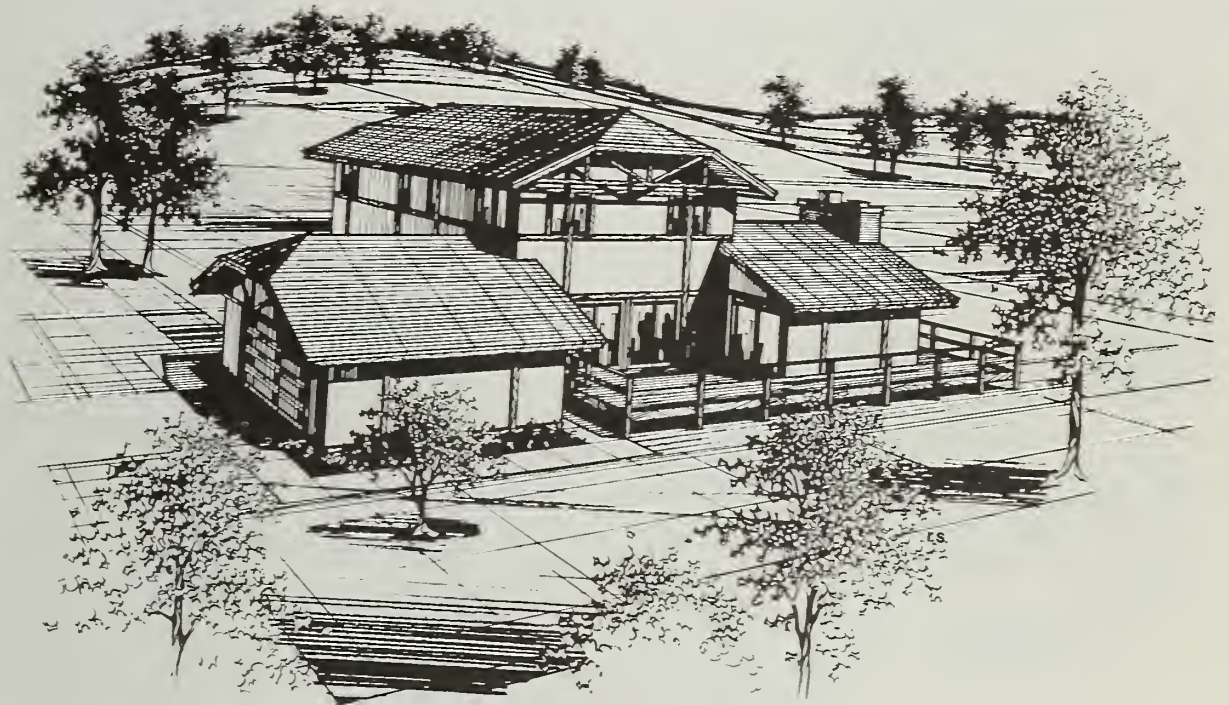
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Truss-Framed System:

Normandy -- Modified Two Story

Large two-story house of traditional half-timber design finished with hardboard siding panels and stained wood trim. Main part of house is framed with two-story truss frames over basement and partial truss frames for roof construction. Family room wing is framed with truss frames over crawl space, and garage with partial truss frames on concrete slab. Primary glass areas are located in end walls that allow unrestricted opening size. Wood decks provide outdoor living space and complement design.



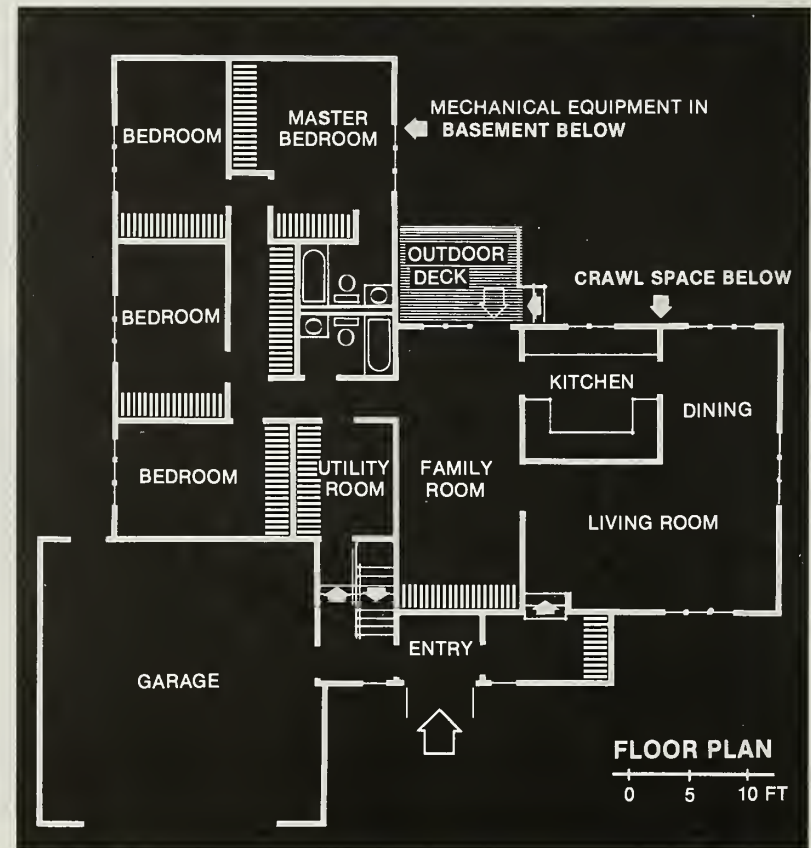
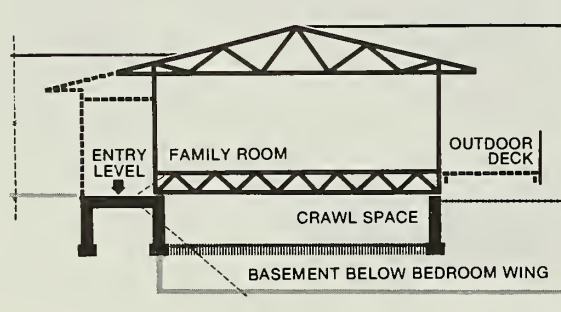


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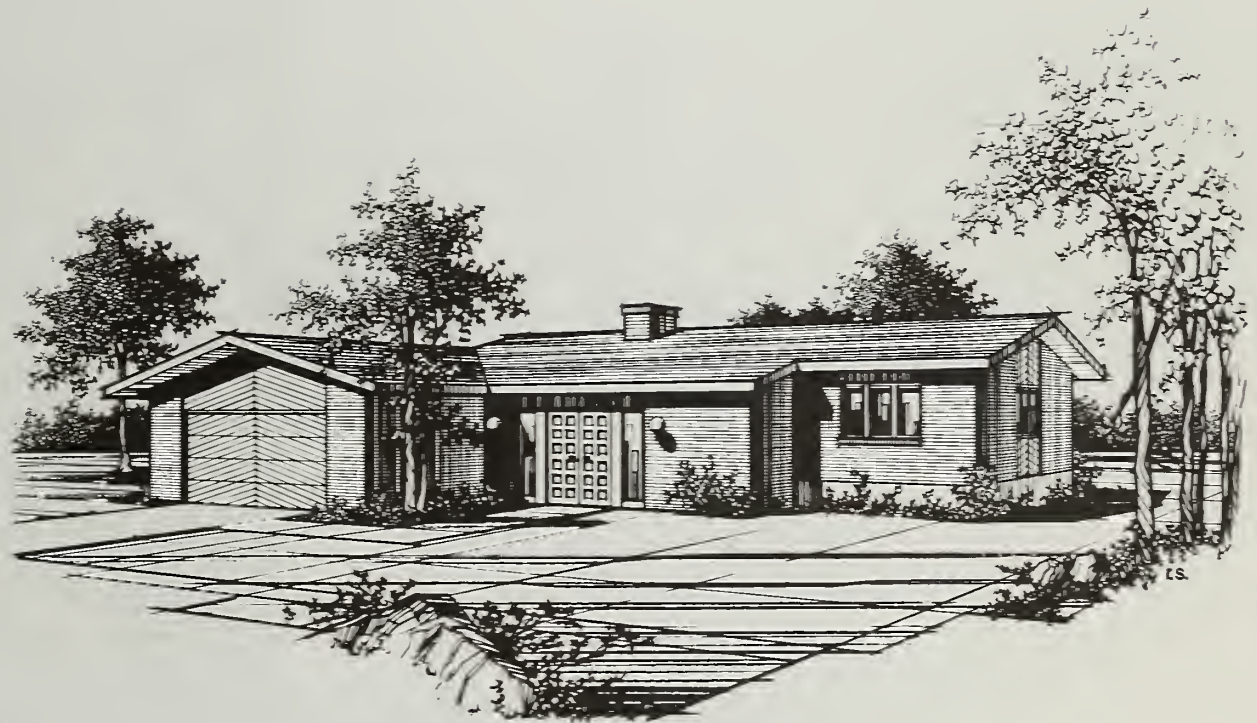
Truss-Framed System:

Homestead -- L-Ranch

Four-bedroom ranch with brick exterior and effective internal zoning between living and sleeping areas. Centrally located family and work areas and large bedrooms with good acoustical separation can accommodate growing families of any age composition. Truss-frame construction provides additional clear-span game area in the basement, where good access also allows convenient servicing of mechanical equipment. Garage is built with partial truss frames, and entrance bay is framed conventionally.



Truss-Framed System:

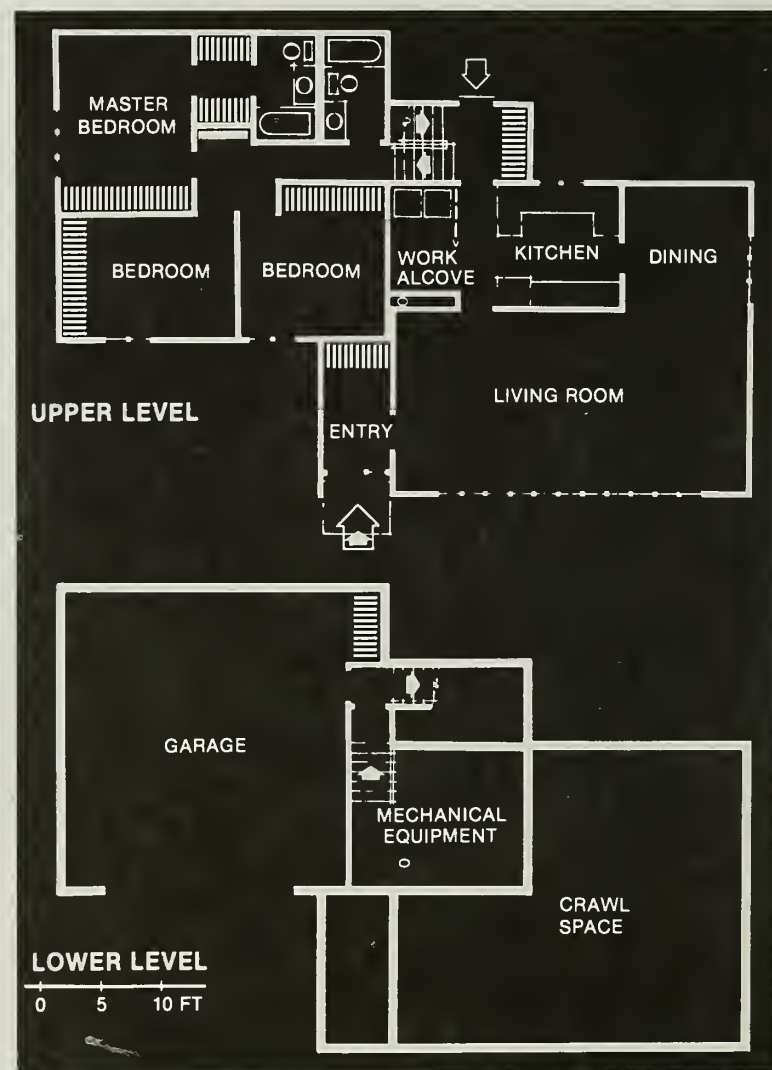
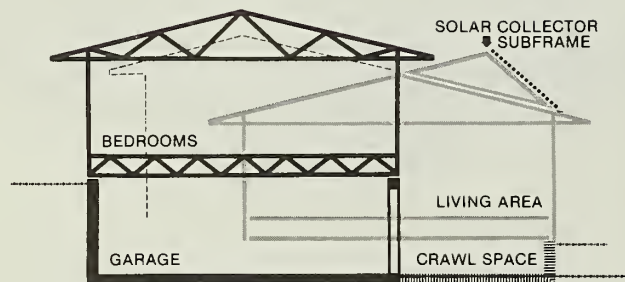


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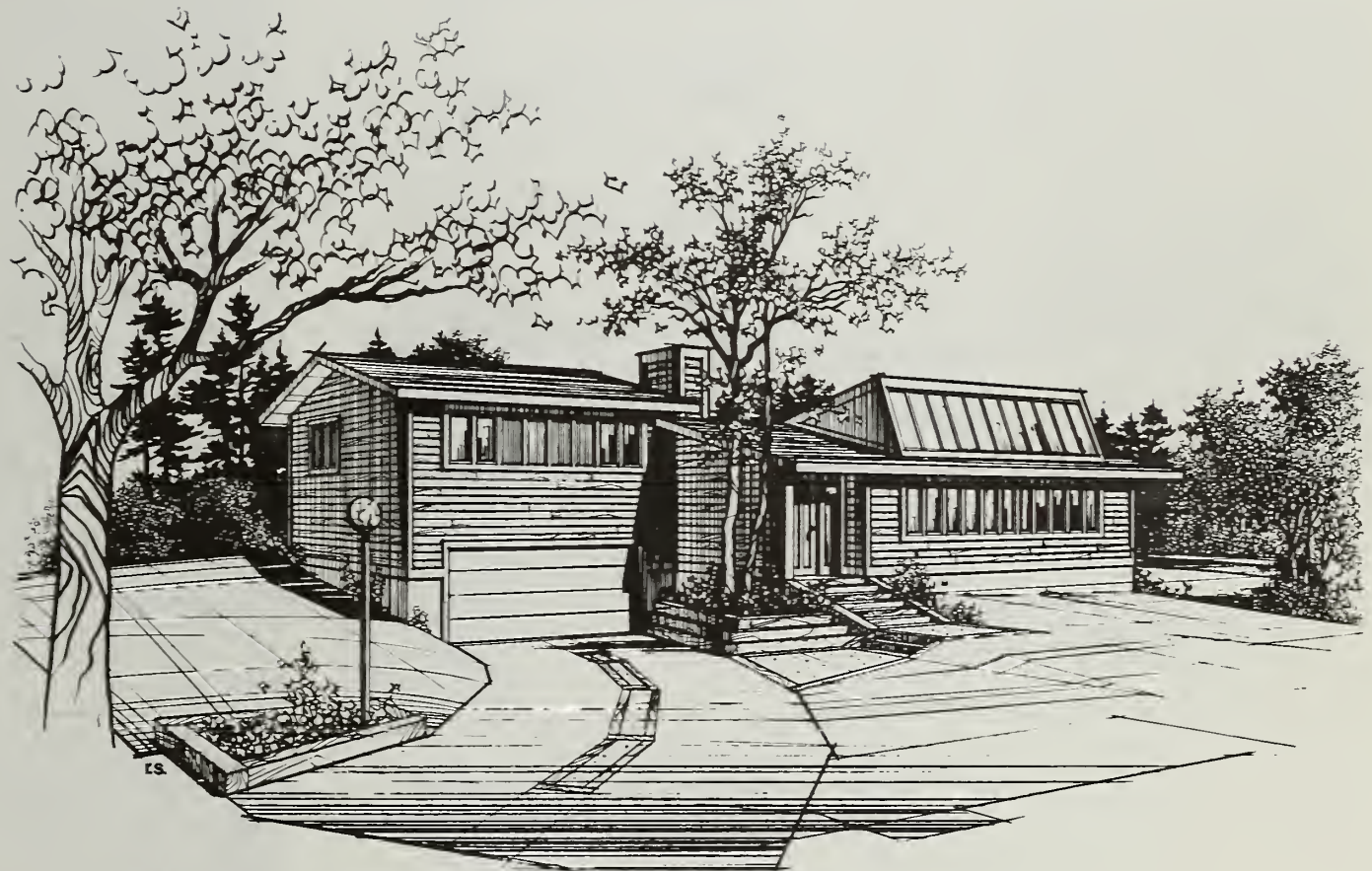
Truss-Framed System:

Sunspot -- Split Level

Contemporary split level ranch with redwood siding. Bedrooms are on upper level over garage, and living areas are located on a lower level over crawl space. Both entrances are protected with conventionally framed vestibules. The crawl space can serve as solar heat storage area. Solar collector panels are supported on conventional low pitch roof by backup framing. An adequate duct chase through living room level and centrally located equipment room are provided to ease future solar retrofit.



Truss-Framed System:

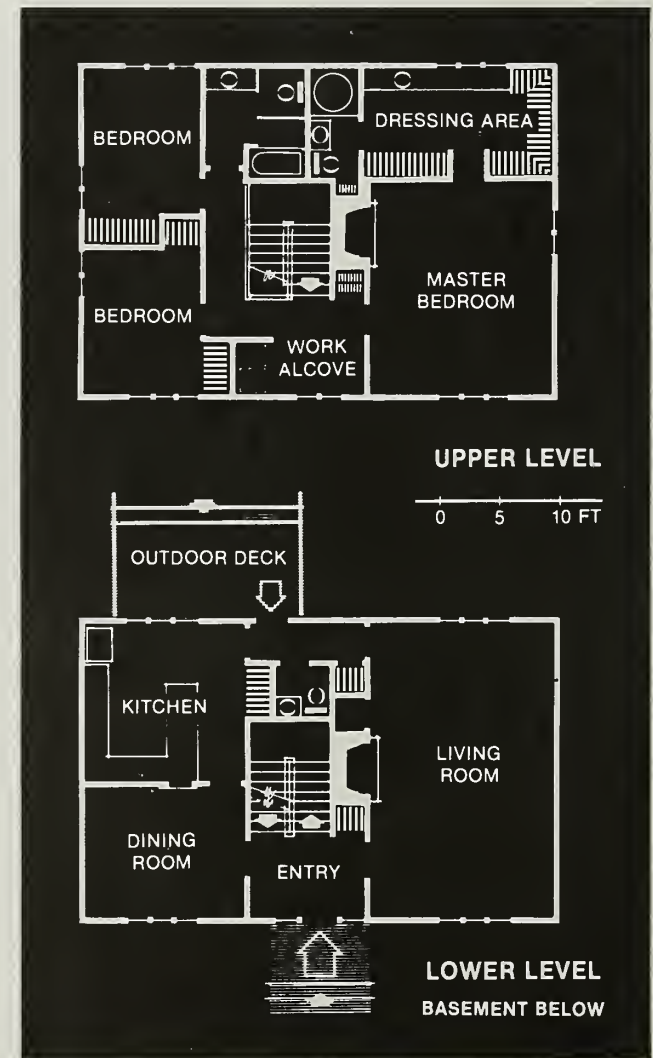
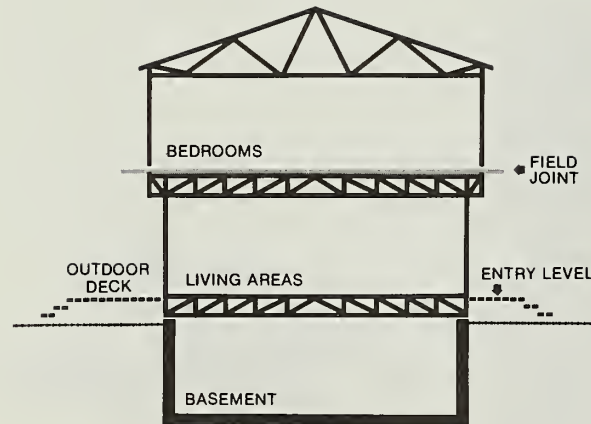


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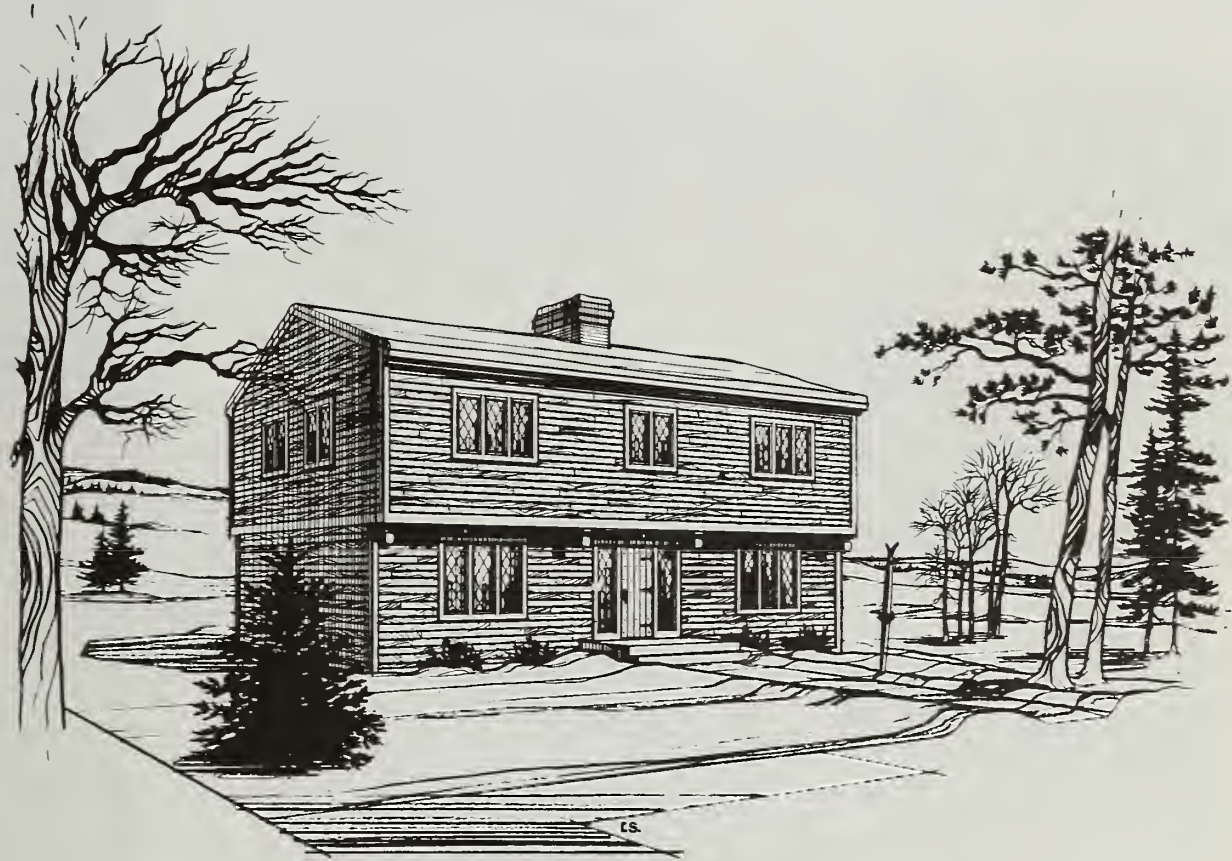
Truss-Framed System:

Garrison -- Two-Story

Two-story house recalling traditional New England design with overhanging second floor, narrow horizontal board siding, casement windows and a central chimney. Both floor trusses are combined in a single truss frame, requiring conventional framing only around stairway. Second floor can be framed with either partial truss frames (roof truss and stud assemblies), or with panelized walls and conventional roof trusses. Wood decks are used at both entrances to raise entry level to floor level.



Truss-Framed System:

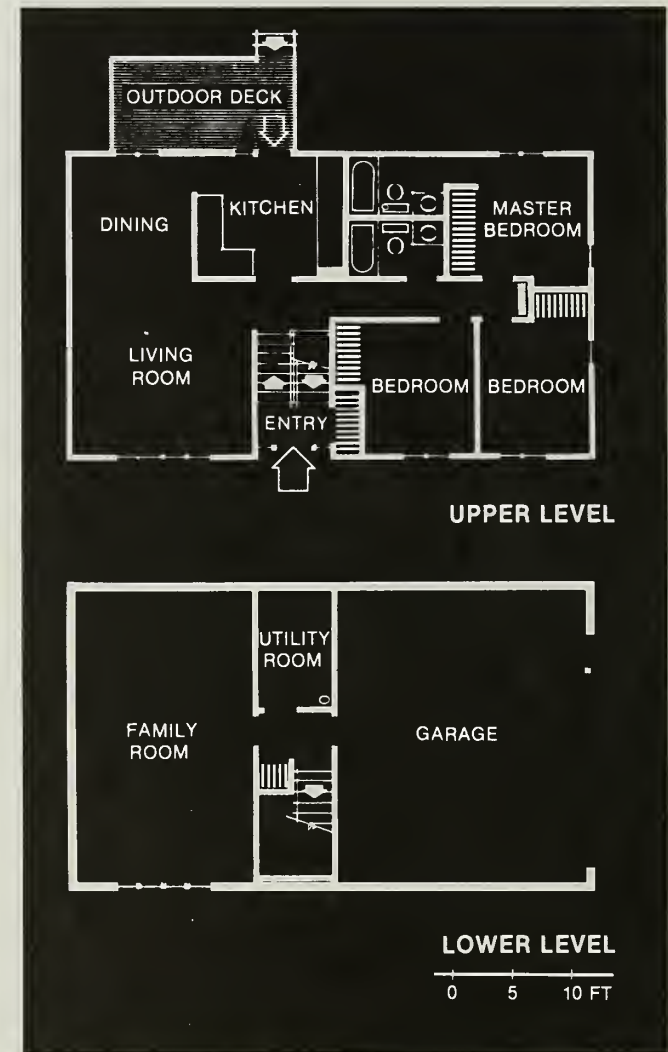
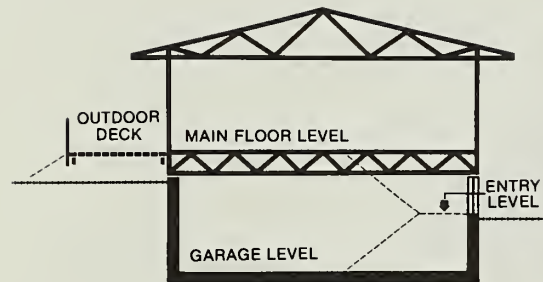


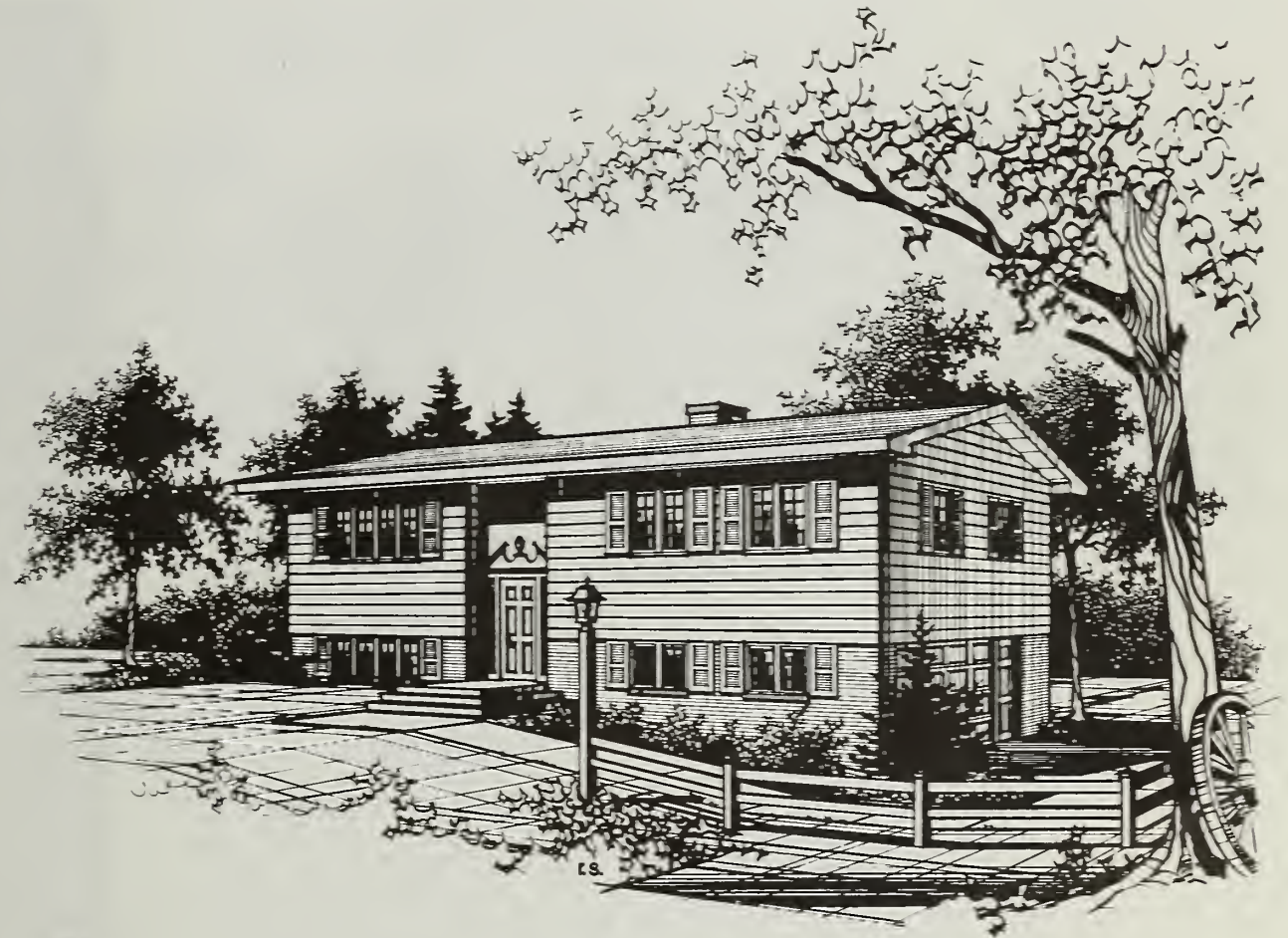
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Truss-Framed System:

Arlington -- Raised Ranch

Traditional and compact split-level entrance 3-bedroom raised ranch with painted hardboard siding. Garage entrance in end wall protects the traditional character of the house, and avoids the need for a header beam across door opening. Eight-foot center section containing stairway is conventionally framed. House is assumed to have southern orientation, and windows in the west end wall are avoided to minimize unwanted solar heat gain and provide more wall space for furniture.



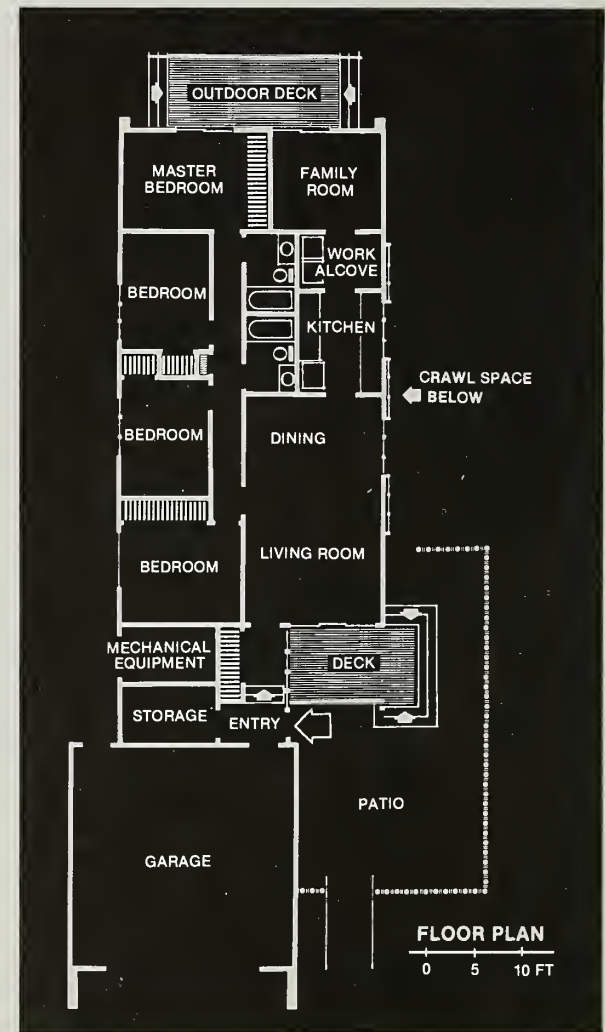
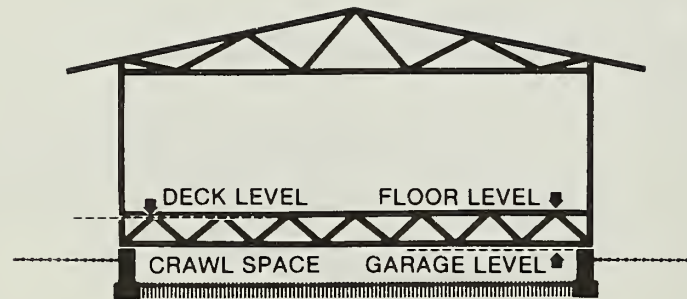


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Truss-Framed System:

Phoenix -- Expanded Bungalow

Compact patio house with traditional design touches, built with truss frames over a crawl space that also serves as solar heat storage rock bed. Solar collector panels are mounted on south wall for maximum protection against summer sun. Major glass areas are located in end walls opening on outdoor living areas. The garage, built with partial truss frames on concrete slab, protects the west end of the house from afternoon sun, and living room windows are protected by louvered patio roof.



Truss-Framed System:

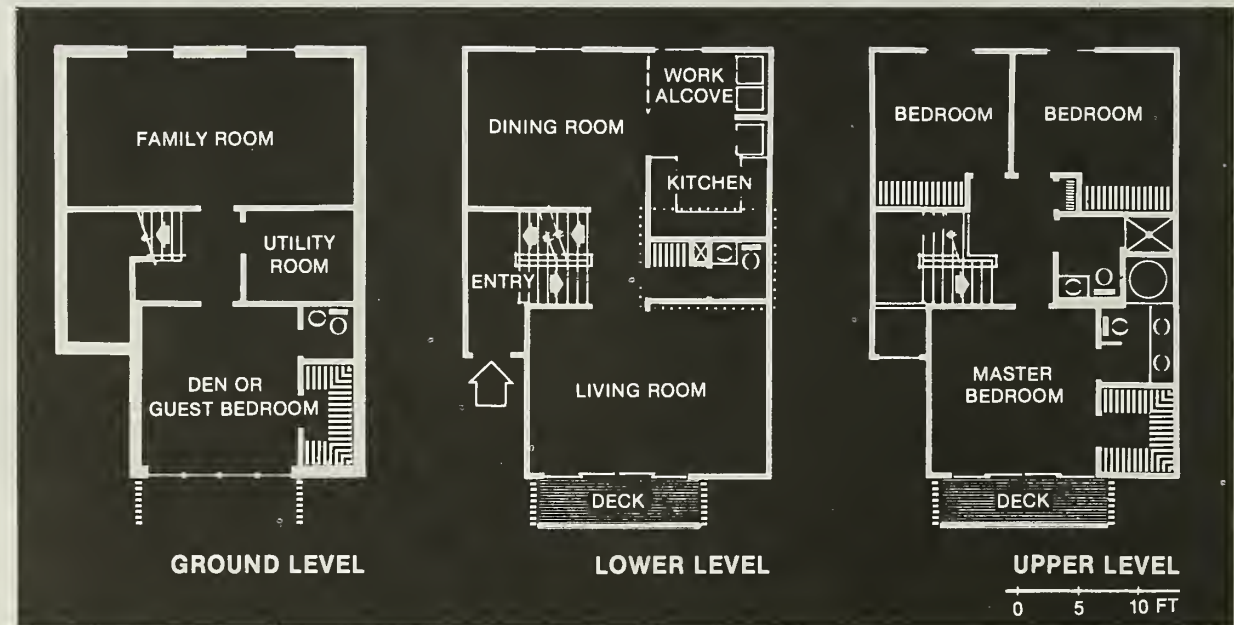
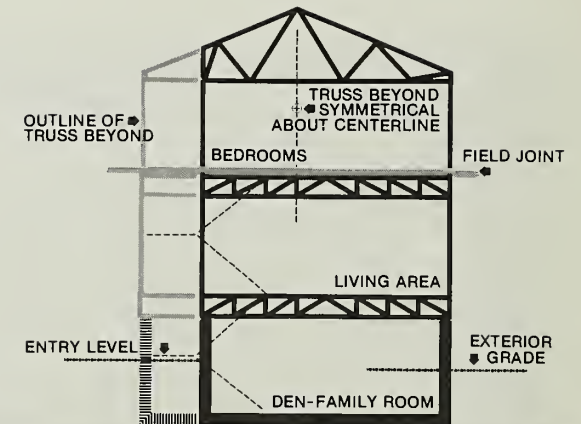


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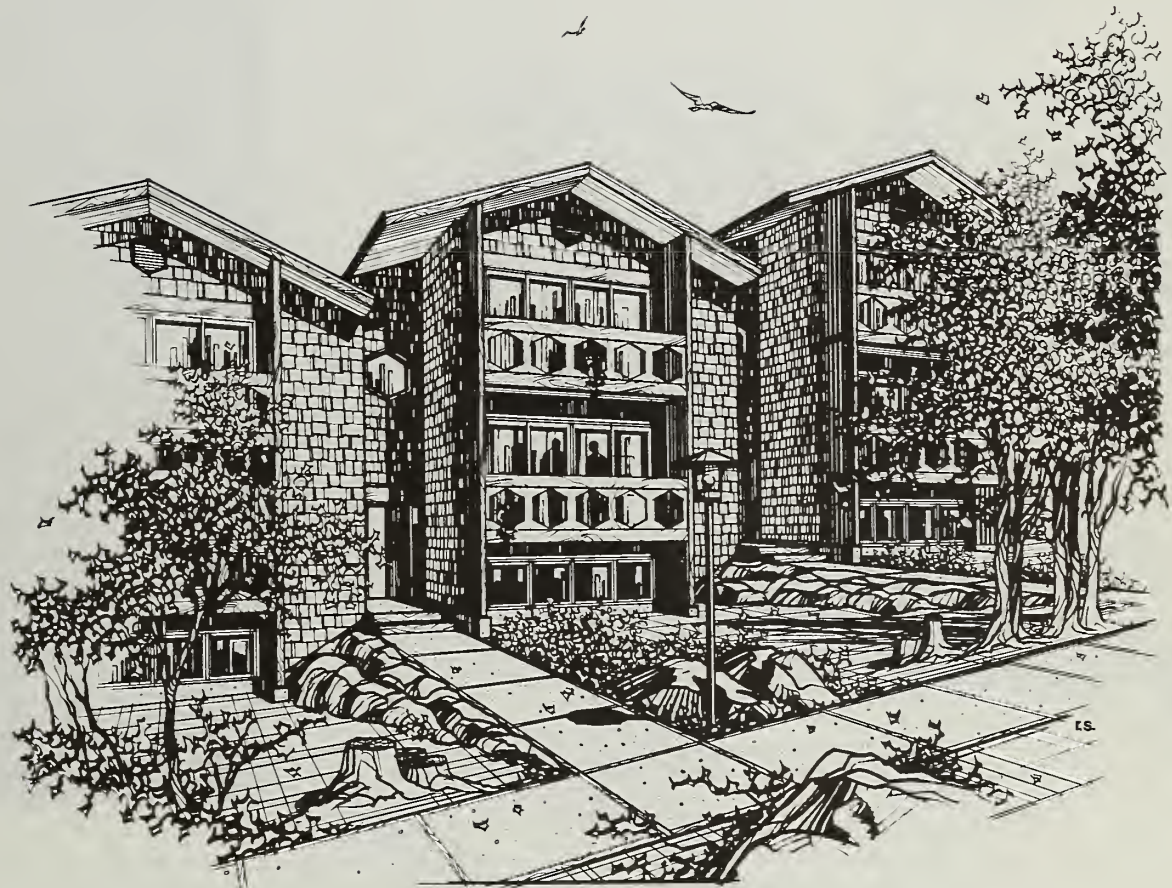
Truss-Framed System:

Chalet -- Three-Story Townhouse

Compact three-story townhouse in truss frame construction with cedar shake exterior finish. Lower level is built with conventional bearing walls, and top floor with partial truss frames (roof truss and stud assemblies). Center section may be framed conventionally, but design is based on use of stacked utility core modules (see dotted outline) containing prefabricated plumbing and mechanical systems. Double wall construction between units provides needed acoustical and fire separation.



Truss-Framed System:



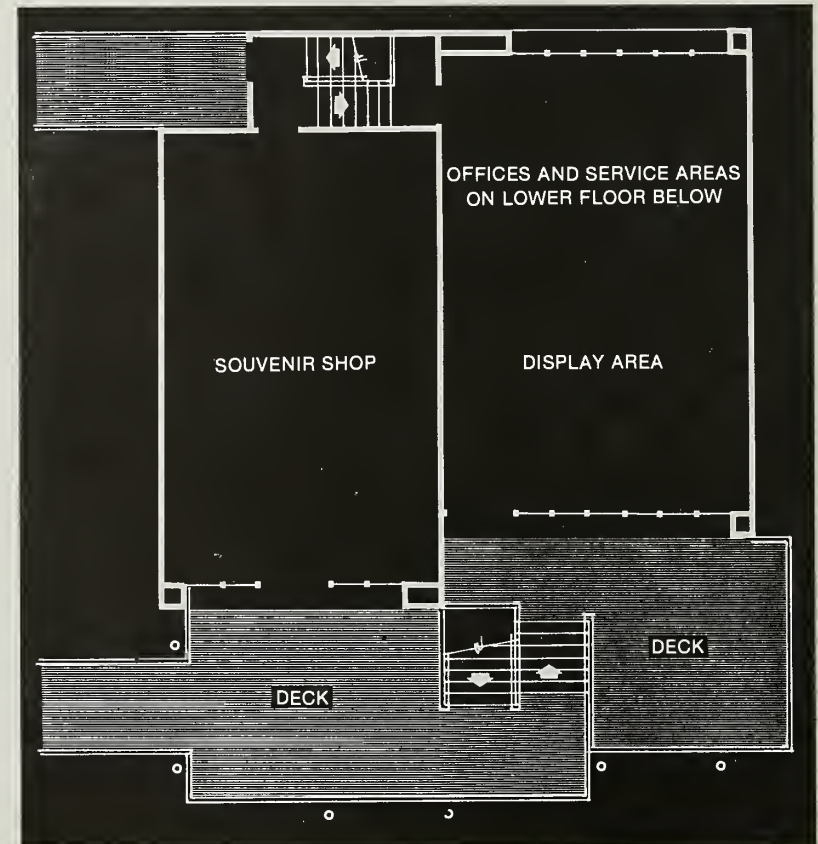
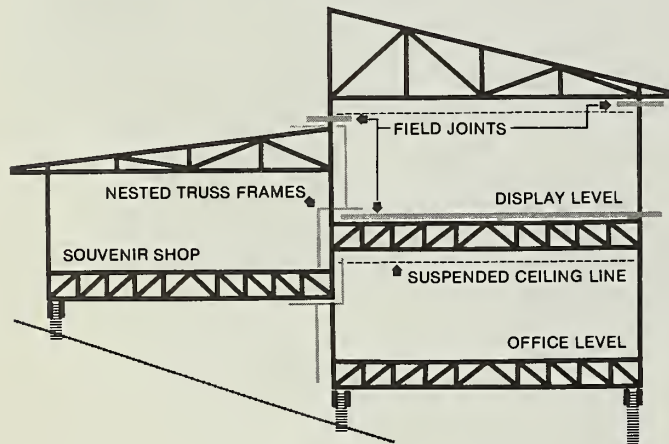
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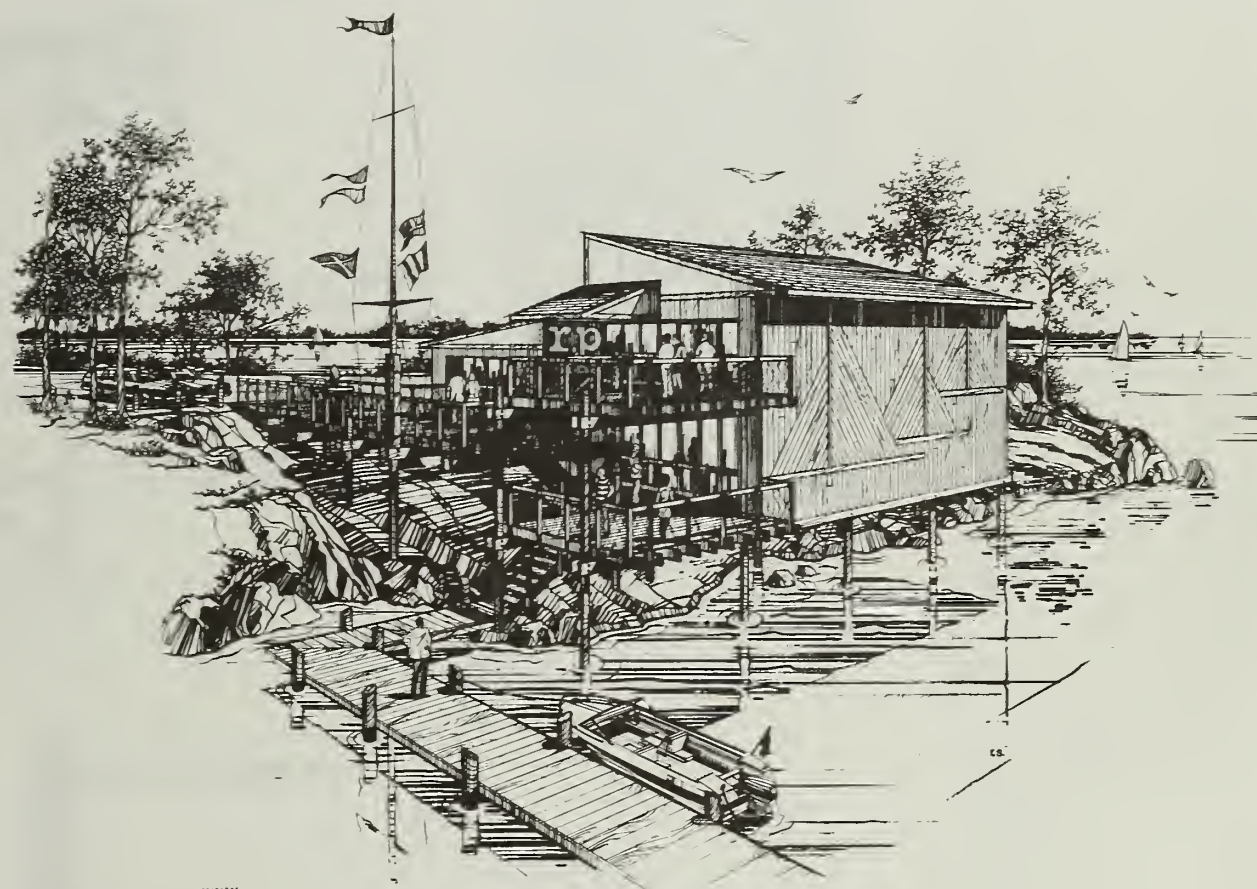
Rocky Point -- Light Commercial

A lakeside visitor center accommodating a souvenir shop, display gallery and office areas illustrates one proposed adaptation of the truss frame concept to light commercial construction. Truss frames are supported on post foundations, and outdoor decks are built in pole construction. The two-story truss-frame assembly contains both

floor trusses and is designed for suspended ceilings. Both one- and two-story frames are nested for bearing along a common reference line on all levels. The upper level roof is built with panelized outside walls and conventional roof trusses. Glass areas are located in end walls for maximum size display windows.



Truss-Framed System:



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Truss-Framed System:

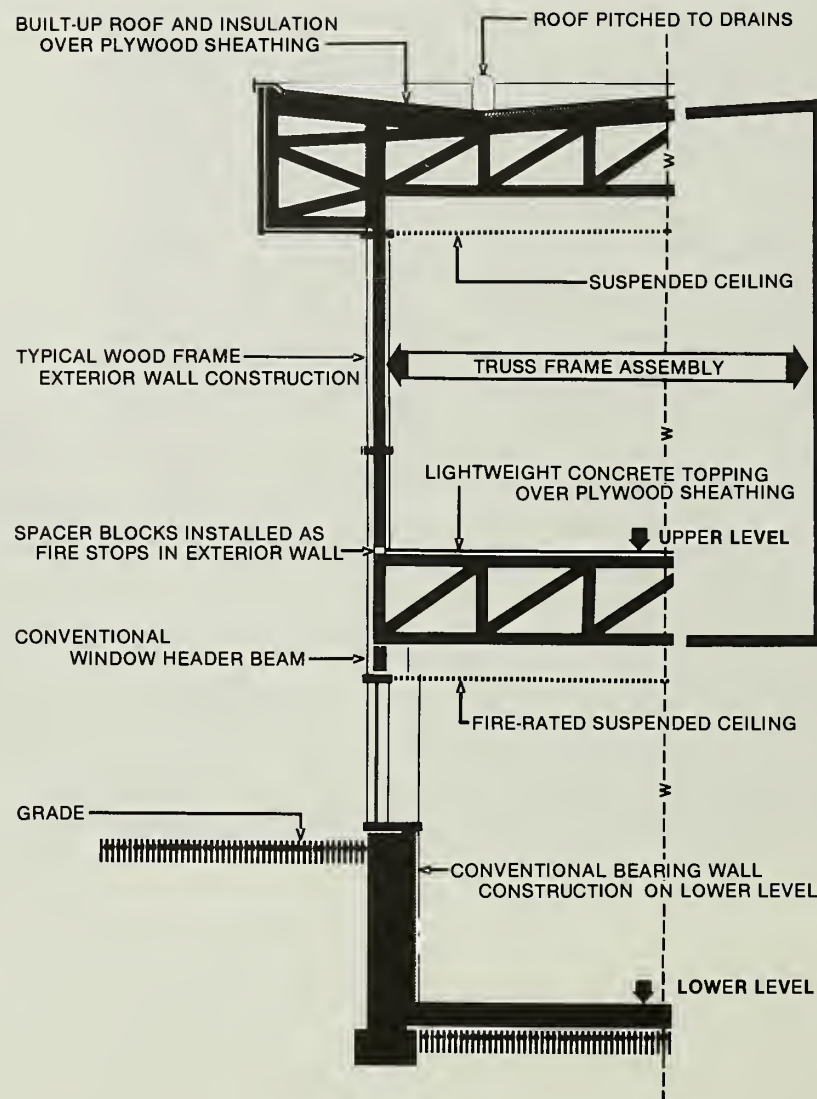
Systems Coordination

The truss frame system is easily adapted to a variety of construction requirements, and lends itself not only to residential but also to light commercial buildings. One potential application is illustrated by the wall section of a two-story structure showing conditions often encountered in such buildings. The exterior grade at lower floor windows may represent an earth berm, or the actual grade on a sloping site that allows ground level access to the lower floor and bridge or stairway access to the upper floor. With a conventional built-up roof, the truss frame assembly can be designed with sufficient floor-to-ceiling clearance to accommodate a suspended ceiling without exceeding transportation restrictions. In a building that is two frames wide, the center corridor can be conventionally framed with relatively shallow floor and roof joists to accommodate longitudinal ductwork on the ceiling below. Branch ducts can be run between or through trusses, and where acoustical separation between adjacent areas is not a critical factor, the truss cavity can serve as an air plenum space. Fire separation

between floors is provided by spacer blocks that are an integral part of the truss frame system. Use of spacer blocks permits correct spacing between frames during erection without field measurements.

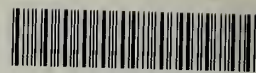
Ease of assembly may prove to be one of the most attractive features of the TFS. All subframing, such as spacers for window heads or sills, is installed after truss frame erection. Door openings in truss frame walls do not need to be prefabricated, but* can be conventionally framed by cutting out one stud after all frames are in place. If structural sheathing is applied at the time of erection, the TFS is both self-aligning and self-bracing. The potential benefits of the TFS, however, may be fully realized only through careful coordination of all subsystems and construction procedures.

* Structural headers are still required as in normal construction.





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